



## A Case Report - Typhoid Enteric Ileal Perforation

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DOI: 10.31080/ASOL.2023.05.0534

**Received:** January 11, 2023

**Published:** February 02, 2023

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### Abstract

Typhoid fever is a community illness that is more intensive in economically developing nations, due to indigent and overpopulation, with absence of potable water and water hygiene. The most threatening complexity of typhoid fever is intestinal perforation, which involves prompt hospital care, detection and operative treatment in order to decrease morbidity rate and prevent fatality. Intestinal perforation due to salmonella continues to be the most prevailing reason for executing emergency surgeries, regardless of various measures such as potable water and garbage disposal. We presently describe a manifestation of multiple intestinal perforations (7) in the Ileum and Cecum in a 35 year old male patient. The significance of precise detection and relevant pre and post-operative care of patients who had been presented with the indication of intestinal perforation has been accentuated in this case report.

**Keywords:** Typhoid; Morbidity; *S. typhi*

### Introduction

In developing countries, typhoid fever is a major public health issue. The frequent fatal complication of Enteric fever is intestinal perforation. The terminal ileum is more prone to typhoid perforation. Typhoid perforation has a high morbidity and mortality rate (9-22%) [1]. It has been estimated that endemic countries, such as sub-Saharan Africa and South Asia, the rate of morbidity is on an elevated level [2].

Typhoid intestinal perforation (TIP) is the most serious complication, occurring in 0.8% to 39% of cases, with a significant rate difference between high-income and low-middle-income countries, owing to non-standardized case definitions, inadequate reporting or surveillance systems, and a lack of clinician awareness. Several independent risk components of ileal perforation have been identified-including short term of manifestations, inadequate antibiotic therapy, masculine gender, and leukopenia [3].

Predominantly, haemorrhage and intestinal perforation in the ileum occurs secondary to the necrosis of lymphoid follicles in small intestine (Peyer's patches), occurring between 2-3 weeks after the inception of the infection. The rate of mortality consequent to typhoidal intestinal perforation in developing countries have been improved over the recent years; However, it has been reported that, there is fluctuation from 5%-80% because of the limitations associated with operative and non-operative procedures [4]. TIP survival may improve with early and appropriate surgical intervention, as well as effective preoperative and postoperative care.

In developing countries, mortality and morbidity following surgical treatment of typhoid ileal perforation remain extremely high. Though some suggestions could enhance the consequences such as -vigorous resuscitation by venous hydration for four to six hours; associated with desirable antibiotic therapy; whereas

assuming for serious abdominal infection and huge stomach washout, last 60 centimetres of the ileum being resected [5]. In the current case study, a rare manifestation of multiple intestinal perforations (5 in the terminal ileum and 2 in cecum) of a 35 year old male patient has been discussed in detail.

## Case Report

A male patient in his mid-thirty's reported to our emergency clinic with a symptom of high grade fever (38.8) for 5 days accompanied with severe lower abdominal pain and vomiting. On examination, the patient's axillary temperature was 38.5°C, and he was toxic and lethargic but without signs of dehydration; abdomen was tender and distended with absence of bowel sounds on auscultation. On internal examination of the rectum, there was empty rectum.

An upright abdominal radiograph showed multiple air fluid levels in a step ladder pattern with free gas evident under both domes of the diaphragm.

Blood investigations concluded the subsequent values: Hematocrit 33%, WBC 14000/cm<sup>3</sup>, platelets 4,68,000/cm<sup>3</sup>, sodium 135 mEq/L, potassium 3 mEq/L, blood urea 30 mg/dl, S. Creatinine 1.05 mg/dl, blood glucose 105 mg/dl, D-dimer 9.53 µg/mL and total bilirubin of 2.5 mg/dl. Diagnostic test for blood borne viruses (HIV, HBV, HCV) were non-reactive. The Widal test was positive with a Titre of > 1:160 for the patient.

An abdominal ultrasonography showed both free fluid and free air with fine floating echoes in peritoneal cavity suggestive for intestinal perforation. Though, the presence of *salmonella typhi* in the blood culture was negative for the patient.

The patient was started with intravenous fluid and antibiotics ceftriaxone and metronidazole were given pre-operatively. For decompression and to monitor the patient's urinary output, Nasogastric tube insertion for decompression and urethral catheterization was carried out for monitoring urine output. Exploratory laparotomy was performed through midline incision and fecal peritonitis with exudative flakes all over the intestine was found. Thorough peritoneal lavage was carried out with normal saline. There were 7 perforations ( 5 in terminal ileum and 2 in cecum) present in distal 35-40 cm of terminal ileum reaching up to ileocecal junction and the Cecum on anti-mesenteric border.

Resection of the perforated intestinal segment with ileo-transverse anastomosis (side-to-side) with proximal loop ileostomy was performed. Abdominal tube drain Fr. 30 was put in pelvis after thorough peritoneal lavage using the normal saline and abdomen was closed in layers. Patient was kept on i.v. fluids and nil orally for 3 days. Broad spectrum antibiotic in the form of 3<sup>rd</sup> generation cephalosporin with metronidazole and fluoroquinolone were given for 7 days. Gastric tube and abdominal drain tube were removed on 3<sup>rd</sup> post -operative day (POD). Ileostomy started functioning on 4<sup>th</sup> POD. Patient was discharged with oral fluoroquinolone for 7 days on 7<sup>th</sup> POD. Severe acute inflammation, with fibrinopurulent exudates extending along the serosal surface of intestine and acute and chronic inflammation was observed immediately adjacent to the site of perforation in the histopathological examination. Confirmation of villous blunting and elongation of the crypts was observed, suggestive of chronic mucosal injury. Isolation of *S. typhi* from resected bowel specimen was not possible, although the stool culture turned out to be positive for *S. typhi*. Polymerase chain reaction for isolation of *S. typhi* was not possible and other serotypes responsible for TIP due to scarcity of resources at our center. These findings were consistent with Typhoidal Intestinal Perforation. With all these findings, the diagnosis of typhoid enteric perforation was confirmed. Patient was on regular follow-up, gained weight, and managed ileostomy properly. The ileostomy was closed after 12 weeks.

## Discussion

Salmonella enterica serovars Typhi and Paratyphi A (*S. Typhi* and *S. Paratyphi A*) cause enteric fever, which is a major community illness in the world. Typhoid ileal perforation is still a serious condition in tropical countries [6].

The most frequent cause of death among people suffering from typhoid fever is intestinal perforation. The mechanism by which infection causes perforation is due to bacterial attachment and invasion, resulting in hyperplasia and necrosis of the immune sentinel microfold cell, which are anatomically visible in Peyer's patches.

Perforation from typhoid is common in the second and third decades of life. The current series' high percentage of cases (40.5%) among the age group of 21-30 years is similar to that reported by

Vyas, Olurin., *et al.* Eggleston and Santoshilo, and K.P. Singh and Kohli [7]. Perforation from typhoid usually occurs in the second and third week of fever.

Butler., *et al.* stated in a study that, intestinal perforation is still a significant cause of death in cases of typhoid fever in developing nations in the era of antibiotics, and that the best treatment for this complication is surgical treatment in conjunction with antibiotic therapy [8].

Typhoid was associated with unsafe water and sanitation practices as well as with consumption of milk products, fruits and vegetables [9]. The disease is only present in places with poor hygienic practises, which makes it easier for the diseases to spread [10]. Furthermore, climatic factors such as rainfall, pressure, and temperature have a significant impact on typhoid infection transmission and distribution in human populations [11].

The usual site of perforation is at the anti-mesenteric border of the ileum; however, other sites can also be affected such as the cecum, jejunum, colon, and, occasionally, the appendix. This report describes a case of multiple intestinal perforations (7) in ileum and cecum.

TIP is most common in middle-aged/adult men [8] who consume contaminated food and water outside the home, as seen in the case of our patient, a 35-year-old man with a history of consuming foods obtained outside the home setting. Furthermore, the patient had been living in one of the urban slums where sewage treatment and waste disposal are deficient, resulting in faecal contamination of the environment. During the rainy season, open sewage flows outside the doors of slum homes, contaminating domestic water sources. These are significant risk factors for the spread of *S. Typhi* infection in the community.

Gas under the diaphragm in an x-ray abdomen standing is a significant finding that can aid in diagnosis. Leukopenia (4000/cu.mm.) seemed to be prominent in a large proportion (61%) of typhoid perforation case scenarios despite peritonitis [12].

The mortality and morbidity rates are primarily determined by the patient's general condition, the virulence of the salmonella, and the duration of disease evolution prior to surgical treatment. That

is why it is critical to provide adequate pre-operative management that includes aggressive resuscitation as well as antibiotic therapy [13].

Mostly 3–34% of situations with typhoid perforation have culture positive for *Salmonella typhi*, and stool and peritoneal fluid cultures are usually negative for this organism.

In our case report, we discovered gross peritoneal contamination with relatively healthy proximal intestine during our investigation. The distal part (35–40 cm) of the ileum, that further involves the cecum, seemed to have seven perforations. As a result, the perforated gut resection, cecum and ascending colon resection, and ileotransverse side-to-side anastomosis with proximal defunctioning ileostomy were the treatment modalities we opted for. Histopathology indicated cryptic changes with Peyer's patches inflammation, acute and chronic inflammation at and closer to the perforated intestine. TIP is consistent with these findings. TIP pathophysiology is complex, relying on both host immunity and bacterial virulence.

Husain M, Khan RN, Rehmani B, Haris H., *et al.* advised resection and anastomosis in multiple perforations with healthier gut, as was accomplished in this patient [14].

Talwar S, Sharma RK, Mittal DK, Prasad P., *et al.* conducted a research on "Typhoid enteric perforation" and concluded that faecal fistula is a serious complication, early limited surgery with thorough peritoneal lavage produces the best results, and the McBurney incision could be more effective in terms of subsequent wound healing [15].

Because intestinal perforation is a common but fatal complication of typhoid fever in developing countries, systemic surveillance related to intestinal perforation operations must be included to accurately estimate the typhoid-associated illness burden in endemic settings [4]. Aside from accurate surveillance, prevention measures (e.g., boiling water and hand washing), typhoid conjugate vaccination, and prompt treatment in high-quality surgical facilities are critical to reducing this important and underappreciated surgical presentation.

## Conclusion

Despite global scientific progress, typhoid fever and its complications remain a major public health concern, particularly in developing countries. Early surgical management, efficient preoperative resuscitation, postoperative care, and the administration of the right antibiotics are all required in the event of salmonella enteric perforation. Not a better operation or better perioperative care, but rather the provision of clean drinking water and improved hygienic practices for the entire global society will enhance the health outcomes of this fatal disease. If you live in or plan to visit areas where typhoid fever is prevalent, you should get vaccinated. Certain guidelines are recommended to be followed since vaccination cannot provide 100% protection such as washing your hands, avoid drinking untreated water, and avoid eating raw fruits.

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